

secondary phenomenon, and Dr. Beck is most probably in error when he ranks this among the primary modifications of ore deposits. The description of secondary alterations of deposits and the formation of gossans is extremely good, the chemical investigation of the subject being especially convincing. It must be noted that Dr. Beck only refers under this head to secondary changes above the permanent water-level (in the region of Pošepny's vadose circulation) and not to the phenomena which have recently attracted so much attention in America, and which, under the head of Secondary Enrichment of Ore Deposits, have been so ably investigated by Emmons, Weed and others; these Dr. Beck appears to omit entirely.

The section on the alteration of the wall rocks of mineral veins either by the influence of these veins themselves or by the agencies that have played an important part in the deposition of the mineral constituents of these veins, is a valuable summary of a very important subject, which has only in comparatively recent years attracted the attention that it deserves.

Coming next to the classification of other mineral deposits, or as Dr. Beck rather awkwardly designates them, "Not vein-like epigenetic ore deposits within stratified rocks," the subdivision is far from satisfactory. They are divided, first of all, as follows:—

- A. Epigenetic ore beds.
- B. Epigenetic ore masses.
- C. Contact-metamorphic ore deposits.
- D. Ore-bearing fillings of cavities.

Unfortunately, the first group contains many deposits that are generally looked upon as typical masses, *e.g.* the lenticular masses of cupriferous pyrites of the Huelva region. The group is subdivided into deposits occurring in crystalline strata and deposits in non-crystalline strata formed by impregnation, each class being then again subdivided according to its mineral contents. This classification is unfortunate, as it causes the author to describe the above-mentioned pyrites deposits as produced by impregnation; it would hardly be possible to assign a less probable genesis to such deposits as these, consisting as they do mainly of dense massive pyrites practically free from gangue, and it seems impossible to imagine that any one who has ever studied these deposits can seriously believe that they owed their origin to impregnation. It is in any case most unlikely that a system of classification that forces these deposits and the Norwegian and other similar pyrites deposits into different groups, and that takes, moreover, no account of the eruptive rocks with which they are so closely associated, can possibly be correct.

The group of Epigenetic ore masses is a rather more coherent one than its title implies, Dr. Beck confining this group to irregular deposits in calcareous rocks. It is perhaps doubtful whether this is the right place for those very puzzling deposits that are generally spoken of as the gold-bearing "reefs" of Pilgrim's Rest, Lydenburg; it is perhaps more likely that these will prove ultimately to be true bedded deposits, though their real character is to-day far from clear.

The next division of the book contains a short but good description of alluvial deposits; the objections to the independent treatment of this group of deposits

have already been pointed out. Apart from these, Dr. Beck's descriptions are thoroughly satisfactory.

The work concludes with a brief but good chapter of general hints upon the search for mineral deposits. In this the author attempts, and with considerable success, to show that the scientific study of mineral deposits can give information of the greatest value to prospectors, and that his subject accordingly possesses, not merely a scientific and academic, but also a technical and commercial interest that should not be overlooked. This last chapter may more especially be recommended to the large number of mining engineers in this country who appear to think that the study of mineral deposits is one that they can venture to neglect as of no practical importance.

It is satisfactory to find that the wish expressed in the review of the first part of this book has been gratified, and that it is furnished with a good topographical as well as a general index, and it is a pleasure to be able to congratulate Dr. Beck on the production of a work of standard value upon the fascinating subject that he has done so much to advance.

HENRY LOUIS.

ORGANIC CHEMISTRY.

Practical Organic Chemistry for Advanced Students.

By Dr. Julius B. Cohen. Pp. xi + 284. (London: Macmillan and Co., Ltd., 1900.) Price 2s. 6d.

IN this enlarged edition Dr. Julius Cohen has increased greatly the value of the book as a manual for advanced students by adding chapters on organic analysis and the determination of the molecular weight. Under the latter heading we are glad to see he describes the preparation of the silver salts of organic acids and of the platinum salts of bases—two operations the description of which is frequently omitted from similar works. The appendix, which treats of the theory in the form of a note on each preparation, has also been enlarged. Our experience has been that students will not trouble to hunt theory in the limbo of an appendix, and the matter of these notes would have been more usefully incorporated in the preparations themselves. The explanations are necessarily condensed and frequently difficult to understand; for example (p. 193), "Aldehydes can only be obtained directly from the fatty acids by distilling the calcium salt with calcium formate; *but in no case by direct reduction, unless in the form of lactones.*"

The preparations are well and clearly described, and the apparently obvious is not ignored. Thus we read (p. 43), "A small balance with celluloid pans, for use on the bench, is indispensable." Such a balance is invariably used by German students in order to estimate their yields, but is a sufficiently rare object in an English laboratory.

Details of the preparation of ninety-seven substances are given, and consequently the book will be of great service, not only to the student, but also to the lecturer. Of the fifty-six substances usually prepared by the honour students at the Owens College, fifty-two are to be found in this book.

In a useful series of "Hints on the investigation of

organic substances" (p. 265) Dr. Cohen has made a most praiseworthy attempt to systematise the analysis of organic substances. This part of the book might advantageously have been expanded (if necessary at the expense of the appendix), when the futility of the closing hint¹ might have been avoided.

The old method for the preparation of diethyl malonate—the *pons asinorum* of the organic chemist—is still given, but a better yield is obtained by the method of Noyes (*Journal of the American Chemical Society*, 18, 1105, 1896); succinic acid melts at 185°, not 180°; the conversion of citraconic into mesaconic acid (p. 112) is due to Fittig, not to Jacobson; methyl oxalate (Prep. 24) is not indexed; and the preparation of kreatinine might advantageously have been omitted.

We must, however, congratulate Dr. Cohen on having produced the best elementary book, in the English language, on practical organic chemistry, and we have found that our students use the book with great confidence and are perfectly able to prepare any of the substances from the descriptions. The book, which is well printed and free from typographical errors, should rank with the similar works of Ludwig Gattermann in German, and of Dupont and Freundler in French.

W. T. L.

OUR BOOK SHELF.

Description of the Human Spines, showing Numerical Variation, in the Warren Museum of the Harvard Medical School. By T. Dwight, M.D., LL.D. (Memoirs of the Boston Society of Natural History). Vol. v. No. 7. Pp. 75. (Boston, U.S.A., 1901.)

THIS memoir is for the greater part a careful description, with elaborate tabulation and adequate illustration, of forty-five anomalous human back-bones which, with one exception, were obtained during many years spent by the author in the dissecting-room of the Harvard Medical School. In the introductory portion of the work the author discusses Rosenberg's methods and well-known theory of "concomitant variations," based on the appreciation of a tendency of the cervical and lumbar regions of the column to absorb into themselves the thoracic, with change progressive and retrogressive at the opposite ends of this. Accepting, without proof, the theory that the human ilium enters into relation with different vertebrae during development, the author passes on to the consideration of irregular segmentation, and a discussion of the views of Baur, Bateson and others on inter- and ex-calculation, deferring the latter author's theory of "homæosis" for consideration in the body of the work. He finally denies the existence of a precise number of lumbar vertebrae, and finds refuge in Welcker's theory of the *vertebra fuleralis*. With this as a determining factor he largely deals, and the most interesting portion of his memoir is that in which he shows it to be the twenty-fourth vertebra in each of seven examples lacking one of the presacral series. He classifies his specimens into classes, and clearly, systematically formulates the individual spines of each, and deals in some cases with correlated modification of the spinal nerves. Arguing that the "essential part of the office of the spine is to form the median support of the trunk," he deduces what he terms a "vitalistic conception," viz., that parts in corresponding situations exhibit a tendency to develop in a

corresponding manner; and in finally discussing Rosenberg's view, he remarks that its success has been largely due to the fact that "it fitted in so perfectly with the doctrine of descent by gradual modifications," and gives as his opinion that, "unfortunately for science," it has "become too much the custom to make everything square with this."

The memoir as a whole is laborious, but accurate and systematic, and will be of great use to the working anthropologist. There is appended a description of some incomplete specimens of interest in the author's collection, and we would remind him that among the quadrupedal mammals co-ossification of the atlas vertebra with the skull is at times found to be an effect of dislocation, and would recommend to his consideration the recent description by Broom of an *Echidna*'s spine having eight cervical vertebrae, and his discovery that in some marsupials the fourth lumbar and anterior caudal vertebrae bear in the young state free ribs.

Where Black Rules White: A Journey across and about Hayti. By H. Prichard. Pp. 288. (Westminster: Archibald Constable and Co., Ltd., 1900.) 12s.

MR. PRICHARD visited Hayti in the year 1899 as a special correspondent of the *Daily Express*; and in the volume under notice we have his impressions and experiences described, with anecdotes and illustrations. He made a short trip into Santo Domingo, to which he devotes a chapter, but otherwise the book is concerned with the people, places and affairs of the part of the island governed by the Hayti Republic. Referring to the people of the Dominican State, Mr. Prichard remarks: "They are not nearly so likeable as the Haytian peasantry, and hospitality does not flourish in the same degree as on the western side of the border. On the other hand, the Government of San Domingo is less jealous of foreign influence. The Dominicans speak Spanish, and have preserved the purity of their language to a far greater degree than can be said of the Haytians, whose French has degenerated into a Creole patois so corrupt that it can with difficulty be understood by outsiders."

From a scientific point of view, the most important statements made relate to Voudou worship and sacrifice. The author says that the people of Hayti are practically under the control of Papalouis or Voudou priests, otherwise Haytian witch-doctors and medicine-men; and he brings charges against them of murders and human sacrifices which the Government of the Republic appears unable to prevent. As to the ceremonies connected with the worship of Voudou, he remarks: "There are said to be two sects of Voudoux: one which sacrifices only fruits, white cocks and white goats to the serpent-god; the other, that sinister cult above referred to, whose lesser ceremonies call for the blood of a black goat, but whose advanced orgies cannot be fully carried out without the sacrifice of the goat without horns—the human child." Miss Kingsley touched upon this subject in her "West African Studies."

Mr. Prichard made a special point while in Hayti of obtaining information as to Voudou ceremonies and sacrifices, and in some cases was able to obtain direct knowledge. He gives an account of personal observations of some of the rites, which should be of interest to ethnologists.

Untersuchungen zur Blutgerinnung. By Dr. Ernst Schwalbe. Pp. 89. (Brunswick: Vieweg, 1900.)

DR. ERNST SCHWALBE herein summarises the previous researches on the chemistry and morphology of the coagulation of the blood, and adds some new observations of his own.

He has employed Reye's method of separating

¹ ["2, Solids.—A mixture of solids may be separated either by use of a suitable solvent which will dissolve one of the constituents more readily than the other, or by means of one of the reagents described above" p. 272].